

## CLAIMS

1. Device for determining the absolute angular position of a turning device with respect to a fixed structure, where said device includes:

5 an encoder adapted for rotation together with the turning device, said encoder includes a main multipolar track and a top turn track which are concentric, said top turn track includes M angular distributed singularities;

a fixed sensor arranged with regard to a gap distance of the encoder including at least three sensing elements where at least two are positioned with regard to the main multipolar track  
10 so as to deliver two periodic signals S1, S2 in quadrature and at least one is positioned with respect to the top turn track so as to deliver an electrical signal S3, the sensor includes an electronic circuit capable of delivering, starting from the signals S1, S2 and S3, two squared digital position signals (A, B) in quadrature which are representative of the angular position of the turning device and one top turn signal (C) in the form of M pulses per revolution of the  
15 encoder;

one processing device of the signals (A, B, C) which includes an appropriate means of counting, to determine, starting from an initial position, variations of the angular positions of the encoder;

means for measuring the angular position of the turning device with an angular  
20 uncertainty of  $\pm T$  in which the M singularities are each representative of an absolute angular position of the turning device and are distributed in the top turn track with an angular distribution between them which is greater than  $2\pm T$ , the processing device includes a means for updating the initial position, which upon detecting a pulse, is capable of discriminating the pulse detected as a function of the angular position coming from the means for measuring and the value to be assigned, with respect to the initial  
25 position, of the absolute angular position associated with said pulse.

2. Device according to claim 1, characterized that each main multipolar track is in the form of a magnetic ring on which equispaced North and South magnetic poles are magnetized with a constant angular width, a magnetic singularity from the top turn track is formed from two  
30 adjacent poles where the magnetic transition is different from the others.

3. Bearing equipped with a determination device according to claim 1, of the type including a fixed bearing race intended to be associated with a fixed device, a turning bearing race intended to be set in rotation by the turning device and bearings arranged between said bearing races, said bearing is characterized in that the encoder is associated with the turning bearing race.

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4. Bearing according to claim 3, characterized in that the sensor is associated with the fixed bearing race.

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5. Steering system for automotive vehicle, characterized in that it includes a device according to claim 1, the encoder is solidly in rotation with a vehicle steering wheel and the sensor is attached solidly to a vehicle chassis, so as to measure the absolute angular position of the steering wheel with respect to the chassis.

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6. System according to claim 5, characterized in that the revolution or sector discrimination means includes a means of analyzing the differential speed of vehicle wheels.

7. System according to claim 5, characterized in the means for measuring the angular position includes an accelerometer or a gyroscope.